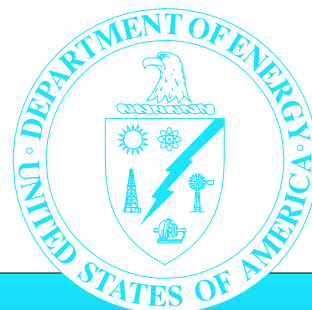


*Los Alamos
National Laboratory*

Safeguards and Security Profile Summary Analysis

June 1997



Office of Environment, Safety and Health

1.0

Introduction

The Department of Energy (DOE), Office of Environment, Safety and Health, conducted a review in June 1997 to determine the status of safeguards and security at the Los Alamos National Laboratory. This review was part of a recent initiative by the Assistant Secretary for Environment, Safety and Health to characterize the current status of safeguards and security programs throughout the Department. The Assistant Secretary for Environment, Safety and Health utilizes the Office of Oversight to provide the Secretary of Energy with independent assessments of the Department's performance in the areas of environmental protection, safety, health, and security. This document describes significant aspects of the safeguards and security posture at the Los Alamos National Laboratory observed during the review.

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Background

Location

Los Alamos National Laboratory is located on the Pajarito Plateau of the Jemez Mountains, about 15 miles northwest of Santa Fe, New Mexico. The Laboratory covers approximately 27,500 acres (43 square miles).

Mission

The Laboratory's mission is to provide technical assistance to the DOE complex, operate certain nuclear weapon production facilities, perform basic research to support its own programs, and support the DOE's research mission. The Laboratory also performs work for other Federal agencies, including the nation's defense and intelligence agencies.

Security Assets/Interests

Los Alamos National Laboratory possesses over 10,000 weapons-grade plutonium and enriched uranium items in the form of metal ingots, weapons parts and assemblies, oxides, and waste, some of which are considered by DOE as attractive radiological sabotage targets. The larger quantities of weapons-grade nuclear materials are stored at three locations at the Laboratory, whereas the smaller quantities of such materials are kept at any one of 26 locations. Classified holdings, classified up to and

including Top Secret, consist of over 7,300,000 classified documents and over 300,000 non-nuclear classified weapons parts, and include information generated in various intelligence programs. There are also approximately 100 programs involving classified work for other Federal agencies. Classified information is processed on over 2,000 computer systems, 1,600 of which are multi-user systems processing data up to the Secret level.

Protection Strategy

The Los Alamos National Laboratory site employs a multiple-layered protection strategy. These layers include: (1) physical barriers (fences, barbed wire, razor ribbon) and electronic intrusion detection systems at the exterior boundaries of site security areas; (2) the buildings in which the assets are located and the intrusion detection systems, alarms, access controls, and search procedures associated with those buildings; and (3) the vaults, vault-type rooms, safes, and associated intrusion detection systems and administrative controls within those buildings in which the assets are stored.

There are a number of administrative and electronic or mechanical protection measures employed at various points throughout the layers of protection. Administrative measures include the security clearances granted to personnel having access to various security interests, a human reliability program that employs random drug and

alcohol tests and psychological testing for personnel with direct access to certain types and quantities of nuclear materials, a staff badging system to distinguish staff with security clearances from those without, numerous entry/exit points staffed by protective force personnel, and protocols such as “two person” rules which assure that at least two personnel are present when nuclear material is being handled in order to minimize the possibility that a single insider could commit a malevolent act undetected. Electronic/mechanical protection measures include various access controls such as cipher locks, magnetic key cards and personal identification numbers, closed circuit television, and an array of safe combination locks and lock and key controls.

Finally, the Laboratory has a protective force that assesses and responds to security matters on site. The protective force includes a highly trained special response team for deployment to security emergencies.

3.0

Results of Past Safeguards and Security Reviews

The most recent safeguards and security review by the Office of Security Evaluations revealed problems at Los Alamos in the protection of classified parts in storage, safety concerns and union/management relations problems involving the protective force, problems with aging and poorly maintained physical security systems, nuclear material accounting and material control deficiencies, and problems in computer security regarding system configuration and contingency planning.

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Results of This Review

Positive Trends and Initiatives

Nuclear material is adequately protected against theft at Los Alamos. As described above, Los Alamos employs multiple layers of defense to protect this material, including physical barriers, electronic detection systems, a highly trained protective force, and administrative controls. Although it might be possible to defeat some of the multiple layers of protection, the system as a whole provides reasonable assurance that theft will be prevented.

In the area of protective forces, since the fatal protective force training accident in 1994, there has been a marked increase in safety awareness within Protection Technologies Los Alamos, the protective force contractor organization. There is evidence of an increasing

safety culture within the organization and an enhanced integration of safety considerations into protective force operations. This has been reflected in significant decreases in reportable injuries, lost work days due to injury, and reportable vehicle accidents. An aggressive program of performance testing was resumed after safety issues involved with the accident were addressed.

The Laboratory has planned and budgeted for enhancements to address many longstanding protection issues, including those involving nuclear material measurements, the storage of weapons components, and aging physical security systems.

The infrastructure of the document control program at the Laboratory is also notable. The establishment and management of control stations, document custodians, and organizational safeguards and security officers provide a solid support structure for classified matter protection. In addition, the self-assessment program and ongoing training initiatives lend support for increased program quality.

Since the most recent Office of Security Evaluations review, the Albuquerque Operations Office and Laboratory management have implemented effective measures to improve the classified computer security program. The separation of the classified portion of the Laboratory's internal computer network from the unclassified portion of that network has provided a greater level of administrative and physical control. A formal configuration management process has also been established for the Laboratory's secure computing network, thereby increasing the security of the network. A Laboratory-wide system of consistent implementation requirements has been developed, and computer security has been incorporated into the development process for engineering and research project management.

Safeguards and Security Concerns

Increased Protection Against Radiological Sabotage

The DOE requires that facilities possessing certain types and amounts of radiological materials protect those materials sufficiently to prevent an adversary from using them to cause unacceptable levels of radiation exposure or environmental damage through acts of radiological sabotage.

Recently, as a part of their ongoing effort to provide current and increasingly accurate vulnerability analyses to support safeguards and security planning, Los Alamos and DOE experts identified some previously unrecognized scenarios in which adversaries might successfully obtain and disperse a sufficient quantity of radioactive material to achieve small, but unacceptable, radiation exposures. In the identified scenarios, the adversary would need to be very determined and would need detailed and accurate knowledge of facilities and operations that could only be obtained from a limited number of employees. Furthermore, there would only be certain days on which the weather conditions would allow a successful dispersion. Nevertheless, for these scenarios, the Los Alamos protection system does not currently provide the level of assurance that DOE requires.

Los Alamos experts, in consultation with security experts from the DOE Los Alamos Area Office, Albuquerque Operations Office, and DOE Headquarters, are formulating compensatory measures that will provide an increased level of security until a series of recently approved upgrades can be installed. These compensatory measures will range from changes in protective force response procedures to significant enhancements to some security systems.

Comprehensive Threat Analysis

DOE requires that its facilities' protection systems be capable of protecting against a design basis threat, which sets forth the types, numbers, and armaments of adversaries, their level of motivation, and the various actions (theft, sabotage, self-sacrifice) that each adversary type may be expected to commit. DOE facilities must design their security systems to protect against the specified threat. However, Los Alamos has not yet fully analyzed all aspects of the design basis threat specified by the Department or tested the ability of its security system to protect against some aspects of this threat. Such analyses and testing are essential to determining whether the security system provides adequate protection in all respects. The Laboratory has now begun conducting these analyses under the general supervision of the DOE Los Alamos Area and Albuquerque Operations Offices, and it is expected that any necessary protection system enhancements identified by the analyses will be implemented.

Increased Protection of Classified Weapons Components

During a 1994 inspection of Los Alamos, the Office of Security Evaluations noted that some classified non-nuclear parts of nuclear weapons with a potentially high value to proliferant nations or other groups wishing to acquire nuclear weapons technology were not being protected in accordance with their sensitivity because of a shortcoming in the DOE policy addressing the protection of classified information. The DOE Headquarters organization responsible for the policy subsequently took appropriate action to identify and direct several protective measures to be taken until the applicable DOE order is revised. The Albuquerque Operations Office forwarded this direction to Los Alamos in 1995, with a followup memorandum in 1996. However, Los Alamos did not take appropriate action to correct the situation.

During a recent Albuquerque security survey of Los Alamos, this issue became a finding, requiring corrective action and contributing to a reduced rating for the Laboratory. During this review, the Office of Security Evaluations confirmed that the situation remains essentially unchanged since 1994.

The direction provided by Headquarters was clear and was reinforced by the DOE Albuquerque Operations Office, which administers the Los Alamos contract for the Department. The Laboratory, while obligated to identify the cost of DOE initiatives and seek guidance concerning funding for the implementation of policy changes, should nevertheless be responsive to DOE direction in issues where scientific or engineering judgment is not at issue.

Issue Warranting Management Attention

Industrial Sabotage at Los Alamos National Laboratory

As DOE nuclear facilities are decontaminated, decommissioned, and closed, the facilities at Los Alamos that support nuclear stockpile maintenance and assurance may become critical to maintaining the operability of the nation's remaining stockpile of nuclear weapons. As a result, these facilities become significant industrial sabotage targets (e.g.,

targeting critical machinery and other essential production and research equipment for destruction in order to cripple the weapons program). While DOE has begun to address industrial sabotage at the Los Alamos National Laboratory, increased overall attention to this kind of potential threat is needed.

Industrial sabotage is inherently difficult to protect against, since a number of critical items of machinery or equipment are vulnerable to their operators or to other workers who may routinely come near them. In the past, DOE had backup equipment capabilities and sufficient contingency plans at most major facilities in the nuclear weapons complex. Los Alamos National Laboratory was often identified as one such facility, offering backup for certain production operations. Its primary mission was research and development, but in order to carry out that mission, it also was charged with providing a viable alternative and a sufficient capability to mitigate the impact of major industrial sabotage (loss of critical equipment) at one of the nation's weapons production facilities. Today, the change in national requirements has reduced both the requirement for nuclear weapons production and the number of facilities with production capabilities. Los Alamos, however, is becoming increasingly important as a facility for nuclear stockpile maintenance, and some Los Alamos facilities have emerged as the most capable of meeting today's weapons program requirements. Moreover, some of its facilities and equipment are recognized as the only ones of their kind in the nation capable of achieving specific weapons safety and assurance objectives, including those associated with the long-term reliability of the nation's nuclear arsenal.

Los Alamos has recognized this potential and has begun the analyses necessary to include these factors and the need to address industrial sabotage in its site security planning. Los Alamos has already identified several targets whose unavailability for an extended period would have a significant adverse impact on national security objectives. Given the inherent difficulty in assuring a high degree of protection for such targets, DOE weapons program managers, as well as Albuquerque Operations Office and Laboratory managers, should carefully identify and evaluate viable protection alternatives in order to avoid incurring substantial security costs while at the same time maintaining the desired protection assurance.